Sub B3

30. (New) A method according to claim 5, including monitoring relative phases of signals in the radiating tracks to bring the difference between the monitored phases at a central resonance frequency nearer to 90°.

C2

31. (New) A method according to claim 1, wherein the monitoring step includes monitoring radio frequency signals in different ones of said tracks and measuring associated relative values of said parameter. Concluded

REMARKS

Claims 1-13 and 20-31 are pending. Claims 14-19 were previously cancelled. Claims 29-31 are newly presented.

The claims are amended to more clearly define the invention. Support for new claims 29-30 is found in original claim 13. Support for new claim 31 is found in original claim 5. The amendment to the claims does not add new matter.

Claim 28 stands rejected under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The examiner's careful consideration of the particular language of claim 28 is appreciated. Claim 28 is amended to provide antecedence for the cylinder axis and make it clearer that the at least one track portion on the end surface of claim 28 is the same track portion or portions located on the flat surface of claim 3, as suggested by the Examiner.

Accordingly, withdrawal of this rejection is respectfully requested.

Claim 1 stands rejected under 35 U.S.C. § 102(e) as anticipated by Filipovic, et al. (i.e., U.S. Patent No. 5,990,847, hereinafter Filipovic). Applicant strongly disagrees with this rejection because the only tuning process described or suggested by Filipovic is a length trimming process that will

inevitably (inherently) decrease the inductance, in contradistinction to all assertions by the Examiner to the contrary.

The passage at column 2, lines 28 to 40 of Filipovic explicitly teaches "trimming the length of the radiator segments." Trimming the length of Filipovic's segments (such as those shown in Figures 8A or 11 of Filipovic) by removing material, inevitably (inherently) involves reducing the lengths of the Filipovic segments because Filipovic only discloses and/or teaches "trimming the length of the radiator segments." This trimming of Filipovic inevitably (inherently) involves reducing the inductance of the segments because of the laws of physics as set for in "Electronic Communication Systems" 4th Ed. edited by George Kennedy discussed below in more detail.

As is evident from Figure 8A of Filipovic, each segment 710 to 708 of Filipovic is a resonant open-circuited line (of length $\lambda/4$). Figure 7-10 (page 201) of "Electronic Communication Systems" 4th Ed. edited by George Kennedy shows the equivalent circuit of such a resonant open-circuited line as the series combination of an inductor and a capacitor (please see the second drawing from the top in figure 7-10 on page 201 of Kennedy). If the inductance is L and the capacitance is C, then reducing the length of the line results in a reduction in both L and C since both are proportional to length, as is evident from Figure 7-2 on page 188 of Kennedy which also states that "the quantities L, R, C and G, shown in Figures 7-2 and 7-3 are all measured per unit length" (emphasis added).

In contrast to Filipovic, Applicant's claim 1 requires "...removing conductive material from at least one of the tracks to increase the inductance of the track ...". For instance, the invention can include removing material by forming an aperture in the track, thereby not trimming the length of the track. It follows that whether you look at a portion of Filipovic's

conductive segment or a complete segment, "trimming" the segment by "removing conductive material" must result in reduction in inductance, not an increase as required by claim 1 of the present application.

Referring to page 3 of the Action, last sentence of section 6 response to arguments, it appears that the Examiner has asked Applicant to explain "why not" the tuning of Filipovic will increase the inductance. The reason that the tuning process of Filipovic (i.e., length trimming) WILL NOT INCREASE the inductance is same as the reason that the tuning process of Filipovic WILL DECREASE the inductance, which reason is the laws of physics as set forth in the Kennedy reference discussed above in more detail.

Accordingly, withdrawal of this rejection is respectfully requested

In section 5, page 1 of the Action and at page 4 of the Action, the Examiner indicates that claims 5-9 and 20-27 are allowed. This indication of allowed claims is very much appreciated.

In section 7, page 1 of the Action and at page 4 of the Action, the Examiner indicates that claims 2-4 and 10-13 would be allowable if rewritten to include all the limitations of the base claim and any intervening claims. This indication of allowable subject matter is very much appreciated.

At page 5 of the Action, the Examiner indicates that claim 28 would be allowable if rewritten to overcome the rejection for indefiniteness and to include all the limitations of the base claim and any intervening claims. This indication of allowable subject matter is very much appreciated.

Other than as explicitly set forth above, this reply does not include acquiescence to statements by the Examiner. In view of the above, all the claims are considered patentable and

allowance of all the claims is respectfully requested. The Examiner is invited to telephone the undersigned (at direct line 512-457-7233) for prompt action in the event any issues remain.

In accordance with 37 CFR 1.136(a) pertaining to patent application processing fees, Applicant requests an extension of time from January 7, 2003 to April 7, 2003 in which to respond to the Office Action dated October 7, 2002. A notification of extension of time is filed herewith.

The Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 50-0456 of Gray Cary Ware & Freidenrich, LLP.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE PURSUANT TO 37 CFR 1.111

EXHIBIT A

IN THE CLAIMS:

Please amend the claims as follows:

1. A method of producing a quadrifilar antenna for circularly polarised radiation at frequencies above 200 MHz, the antenna comprising a plurality of substantially helical conductive radiating tracks located on an electrically insulative substrate, wherein the method comprises monitoring at least one electrical parameter of the antenna and removing conductive material from at least one of the tracks to increase the inductance of the track and thereby to bring the monitored parameter nearer to a predetermined value.

2. A method according to claim 1, wherein the conductive material is removed from the track by laser etching an aperture in the track, leaving the edges of the track intact on either side of the aperture.

3. A method according to claim 1 for producing an antenna in which the substrate is substantially cylindrical and the tracks include portions on a cylindrical surface of the substrate and a flat surface of the substrate, wherein the conductive material is removed from a track portion or portions located on the flat surface.

4. A method according to claim 1 for producing an antenna having a plurality of helical track portions located in a substantially cylindrical substrate surface, and a plurality of respective connecting track portions located on a substantially flat end surface of the substrate to connect the

helical track portions to an axial feeder, wherein the material removal step comprises forming a cut-out in at least one of the connecting track portions.

5. A method of producing a quadrifilar antenna for circularly polarised radiation at frequencies above 200 MHz, the antenna comprising a plurality of substantially helical conductive radiating tracks located on an electrically insulative substrate, wherein the method comprises monitoring at least one electrical parameter of the antenna and removing conductive material from at least one of the tracks to bring the monitored parameter nearer to a predetermined value, thereby to increase the inductance of the track,

wherein the monitoring step comprises coupling the antenna to a radio frequency source, bringing probes into juxtaposition with the tracks at predetermined locations, and measuring at least the relative phases of signals picked up by the probes associated with different respective tracks when the radio frequency is operated.

6. A method according to claim 5, wherein the probes are capacitively coupled to the respective tracks.

7. A method according to claim 5, wherein the probes are located in registry with track portions corresponding to the positions of voltage minima when the radio frequency source is tuned to the intended operating frequency of the antenna.

8. A method according to claim 5, wherein the probes are located in registry with end portions of the helical tracks.

9. A method according to claim 5 for producing an antenna in which each track has a first end portion adjacent a feed location and a second, opposite end portion spaced from the said feed location, wherein the material removal step comprises forming cut-outs in the first end portions and the monitoring step includes positioning the probes in juxtaposition with the second end portions.

10. A method according to claim 1, wherein material is removed from the tracks by forming a rectangular aperture in each affected track, the aperture having a predetermined width transverse to the direction of the track which is computed automatically in response to the result of the monitoring step.

11. A method according to claim 10, wherein with the width and length of the aperture are variable in response to the said monitoring result.

12. A method according to claim 1, wherein the monitoring step includes feeding the antenna with a swept frequency signal over a frequency range including the intended operating frequency of the antenna, monitoring the relative phases and amplitudes of signals in the radiating tracks, and removing conductive material from at least two of the tracks to bring the frequency at which substantial phase orthogonality occurs closer to the intended operating frequency.

13. A method according to claim 1, wherein the monitoring step includes feeding the antenna with a swept frequency signal over a frequency range including the intended operating frequency of the antenna, monitoring the relative phases and amplitudes of signals in the radiating tracks to bring the difference between the monitored phases at a central resonant frequency nearer to 90°.

20. A method of producing a quadrifilar antenna for circularly polarised radiation at frequencies above 200MHz, the antenna comprising a plurality of helical conductive radiating tracks located on an electrically insulative substrate, wherein the method comprises monitoring at least one electrical parameter of the antenna and removing conductive material from at least one of the tracks to bring the monitored parameter nearer to a predetermined value, thereby to increase the inductance of the track, and wherein the monitoring step comprises coupling the antenna to a radio frequency source, bringing probes into juxtaposition with the tracks at predetermined locations, and measuring at least the relative amplitudes of radio frequency signals picked up by the probes associated with different respective tracks when the radio frequency source is operated.

21. A method according to claim 20, wherein the probes are capacitively coupled to the respective tracks.

22. A method according to claim 20, wherein the probes are located in registry with track portions corresponding to the positions of voltage minima when the radio frequency source is tuned to the intended operating frequency of the antenna.

23. A method according to claim 20, wherein the probes are located in registry with end portions of the helical tracks.

24. A method according to claim 20, wherein the material removal step comprises forming cut-outs in the first end portions and the monitoring step includes positioning the probes in juxtaposition with the second end portions.

25. A method of producing a quadrifilar antenna for circularly polarised radiation at frequencies above 200 MHz, the antenna comprising a plurality of helical conductive radiating tracks located on an electrically insulative substrate, wherein the method comprises monitoring at least one electrical parameter of the antenna and removing conductive material from at least one of the tracks to form an aperture in each affected track to increase the inductance of the track and thereby to bring the monitored parameter nearer to a predetermined value.

26. A method according to claim 25, wherein the aperture is rectangular.

27. A method of producing a quadrifilar antenna for circularly polarised radiation at frequencies above 200 MHz, the antenna comprising a plurality of helical conductive radiating tracks located on an electrically insulative substrate, wherein the method comprises monitoring at least one electrical parameter of the antenna and removing conductive material from at least one of the tracks to bring the monitored parameter nearer to a predetermined value, thereby to increase the inductance of the track, and wherein the monitoring step includes feeding the antenna with a swept frequency signal

over a frequency range including the intended operating frequency of the antenna, and monitoring the relative amplitudes of signals in the radiating tracks.

28. (Amended) A method according to claim 3, wherein the flat surface is an end surface of the cylindrical substrate, which surface is substantially perpendicular to a cylinder axis, and wherein the conductive material is removed from at least one ~~a~~ track portion ~~or portions~~ located on the ~~an~~ end surface [substantially perpendicular to the cylinder axis].

Please add the following new claims:

29. (New) A method according to claim 1, including monitoring relative phases of signals in the radiating tracks to bring the difference between the monitored phases at a central resonant frequency nearer to 90°.

30. (New) A method according to claim 5, including monitoring relative phases of signals in the radiating tracks to bring the difference between the monitored phases at a central resonance frequency nearer to 90°.

31. (New) A method according to claim 1, wherein the monitoring step includes monitoring radio frequency signals in different ones of said tracks and measuring associated relative values of said parameter.